

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

|   |  |  |
|---|--|--|
| Applicant's or agent's file reference<br><b>11669.237WOU1</b> | <b>FOR FURTHER ACTION</b><br>see Form PCT/ISA/220<br>as well as, where applicable, item 5 below. |  |
| International application No.<br><b>PCT/US2004/025247</b>     | International filing date (day/month/year)<br><b>04/08/2004</b>                                  | (Earliest) Priority Date (day/month/year)<br><b>29/01/2004</b> |
| Applicant<br><br><b>GENENTECH, INC.</b>                       |  |  |

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 8 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the report**

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. ☒ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☒ **Certain claims were found unsearchable** (See Box II).

3. ☒ **Unity of invention is lacking** (see Box III).

**4. With regard to the title,**

☐ the text is approved as submitted by the applicant.

☒ the text has been established by this Authority to read as follows:

**VARIANTS OF THE EXTRACELLULAR DOMAIN OF BCMA AND USES THEREOF**

**5. With regard to the abstract,**

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

**6. With regard to the drawings,**

- a. the figure of the **drawings** to be published with the abstract is Figure No. \_\_\_\_\_

☐ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

- b. ☒ none of the figures is to be published with the abstract.

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## Box No. I Nucleotide and/or amino acid sequence(s) (Continuation of item 1.b of the first sheet)

1. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, the international search was carried out on the basis of:

a. type of material

☒

a sequence listing

☐

table(s) related to the sequence listing

b. format of material

☒

in written format

☒

in computer readable form

c. time of filing/furnishing

☒

contained in the international application as filed

☐

filed together with the international application in computer readable form

☒

furnished subsequently to this Authority for the purpose of search

2. ☒ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

3. Additional comments:

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## Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:  
  
Although claims 41-50 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

### Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

10/587370

IAP11 Rec'd PCT/PTO 26 JUL 2006

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FURTHER INFORMATION CONTINUED FROM PCT/SA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-7 (completely), 14 (completely), 16+17 (partially), 18+19 (completely), 22-35 (partially), 36 (completely), 38 (completely), 40 (partially), 41 (completely), 43-50 (partially)

Claims which relate to variants of the cysteine rich domain of BCMA wherein the ability to bind APRIL is retained or enhanced; nucleic acids encoding these variants; vectors and host cells comprising these nucleic acids; methods of using the variant polypeptides

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2. claims: 8-13 (completely), 15 (completely), 16+17 (partially), 20+21 (completely), 22-35 (partially), 37 (completely), 39 (completely), 40 (partially), 42 (completely), 43-50 (partially)

Claims which relate to variants of the cysteine rich domain of BCMA wherein the ability to bind BAFF is retained or enhanced; nucleic acids encoding these variants; vectors and host cells comprising these nucleic acids; methods of using the variant polypeptides

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## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C07K14/705 C12N15/12 A61K38/00 G01N33/50

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C07K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, WPI Data, PAJ, EMBASE, CHEM ABS Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No. |
|------------|---|-----------------------|
| P,X        | <p>PATEL DARSHANA R ET AL: "Engineering an APRIL-specific B cell maturation antigen" JOURNAL OF BIOLOGICAL CHEMISTRY, vol. 279, no. 16, 16 April 2004 (2004-04-16), pages 16727-16735, XP002318161 ISSN: 0021-9258 the whole document</p> <p>-----<br/>-/--</p> | 1-50                  |

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

## \* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*Z\* document member of the same patent family

Date of the actual completion of the international search

18 May 2005

Date of mailing of the international search report

09.06.2005

Name and mailing address of the ISA

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Authorized officer

Weikl, M

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No.                             |
|------------|--|---|
| A          | BODMER J-L ET AL: "The molecular architecture of the TNF superfamily"<br>TIBS TRENDS IN BIOCHEMICAL SCIENCES,<br>ELSEVIER PUBLICATION, CAMBRIDGE, EN,<br>vol. 27, no. 1,<br>1 January 2002 (2002-01-01), pages 19-26,<br>XP004332356<br>ISSN: 0968-0004<br>cited in the application<br>the whole document  | 1-7,14,<br>16-19,<br>22-36,<br>38,40,<br>41,43-50 |
| A          | GORDON NATHANIEL C ET AL: "BAFF/BLyS<br>receptor 3 comprises a minimal TNF<br>receptor-like module that encodes a highly<br>focused ligand-binding site."<br>BIOCHEMISTRY,<br>vol. 42, no. 20, 27 May 2003 (2003-05-27),<br>pages 5977-5983, XP002318162<br>ISSN: 0006-2960<br>cited in the application<br>page 5979, column 2, paragraph 3 - page<br>5981, column 2, paragraph 2; table 2 | 1-7,14,<br>16-19,<br>22-36,<br>38,40,<br>41,43-50 |
| A          | MACKAY FABIENNE ET AL: "The TNF family<br>members BAFF and APRIL: The growing<br>complexity."<br>CYTOKINE AND GROWTH FACTOR REVIEWS,<br>vol. 14, no. 3-4, 2003, pages 311-324,<br>XP002318163<br>ISSN: 1359-6101<br>the whole document   | 1-7,14,<br>16-19,<br>22-36,<br>38,40,<br>41,43-50 |
| A          | WO 01/60397 A (GENENTECH, INC)<br>23 August 2001 (2001-08-23)<br>claims 54-61  | 44-50   |
| X          | DATABASE UniProt 1 July 1993 (1993-07-01),<br>"Tumor necrosis factor receptor<br>superfamily member 17 (B-cell maturation<br>antigen) BCMA"<br>XP002328537<br>Database accession no. Q02223<br>abstract  | 8-13,<br>15-17,<br>20-35,<br>37,39,<br>40,42-50   |
| X          | LIU YINGFANG ET AL: "Ligand-receptor<br>binding revealed by the TNF family member<br>TALL-1."<br>NATURE (LONDON),<br>vol. 423, no. 6935,<br>1 May 2003 (2003-05-01), pages 49-56,<br>XP002328536<br>ISSN: 0028-0836<br>page 52, column 1, paragraph 2 - page 52,<br>column 2, paragraph 1  | 8-13,<br>15-17,<br>20-35,<br>37,39,<br>40,42-50   |
|            | -----<br>-/--  |   |

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No.                                      |
|------------|--|--|
| A          | <p>OREN D A ET AL: "Structural basis of BLyS receptor recognition"<br/>NATURE STRUCTURAL BIOLOGY, NEW YORK, NY, US,<br/>vol. 9, no. 4, April 2002 (2002-04), pages 288-292, XP002286033<br/>ISSN: 1072-8368<br/>the whole document -----</p> | <p>8-13,<br/>15-17,<br/>20-35,<br/>37,39,<br/>40,42-50</p> |

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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| Patent document<br>cited in search report |   | Publication<br>date |    | Patent family<br>member(s) |  | Publication<br>date |
|---|---|---------------------|----|----------------------------|--|---------------------|
| WO 0160397                                | A | 23-08-2001          | AU | 2048501 A                  |  | 27-08-2001          |
|   |   |                     | CA | 2396793 A1                 |  | 23-08-2001          |
|   |   |                     | EP | 1255558 A1                 |  | 13-11-2002          |
|   |   |                     | JP | 2003522800 T               |  | 29-07-2003          |
|   |   |                     | WO | 0160397 A1                 |  | 23-08-2001          |
| <hr/>                                     |   |                     |    |                            |  |                     |

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